# AMATEUR CINE WORLD

MARCH—MAY, 1946

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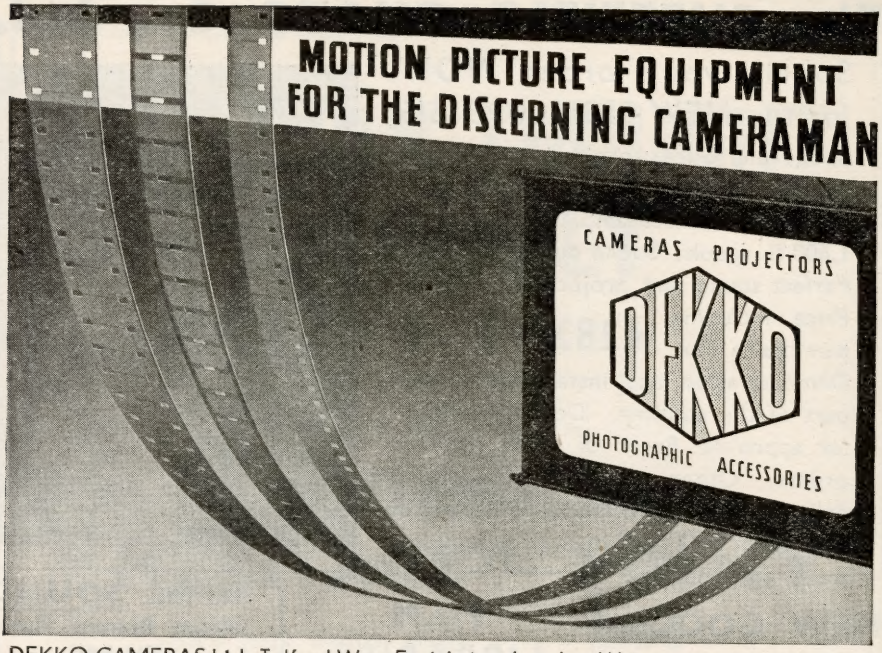


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**GORDON S. MALTHOUSE,** *Editor*

# *Silence is Still Golden*

THE lifting of the restrictions on the supply of cine goods does not mean that they will be any less scarce for some time to come, for labour and materials are still short, and much of what will be produced will be available only for our more fortunate readers overseas. But although one is resigned to the fact that the day when one will be able to buy as much film stock as one likes or acquire a new camera is, though nearer, still distant, many readers will permit themselves the hope that the supply of at least one of their wants will be more in step with their desires.

We refer to silent library films. There has been no sign for a very long time (save from the British Film Institute) of any "new" silent releases. The "sound" enthusiast has been much better served, for the 16mm. sound projector attained almost the status of a weapon of war, and may certainly be expected to serve the cause of peace—and trade—since the immense market which has been created cannot be allowed to go unsatisfied.

An indication of this was the announcement a little while ago that Loew's International, the foreign distribution subsidiary company of M-G-M films would release 16mm. prints of all M-G-M features and shorts outside the United States and Great Britain. It is assumed that other companies will follow suit; indeed, news has been received that Warner Brothers are setting up 16mm. printers in their studio laboratory.

The news reel, too, is destined to share screen honours with 16mm. One company—again in America, but repercussions in this country may be anticipated—is making plans for correspondents to shoot news events on 16mm. and rush the negative by air to New York, where the shots will be selected, edited and blown up to 35mm. The experienced amateur might well be able to participate in this work—but "experienced" is the operative word, for enlargement of all but first-class negatives from 16mm. to 35mm. offers many difficulties.

These straws in the wind betoken a very refreshing and invigorating breeze for the owner of a 16mm. sound projector, but what of the "silent" devotee? What can he grapple to in hope? In the words of Hamlet: "The rest is silence." And yet outstanding films are available. Here are some of the 9.5mm. films the amateur is able to enjoy in France:

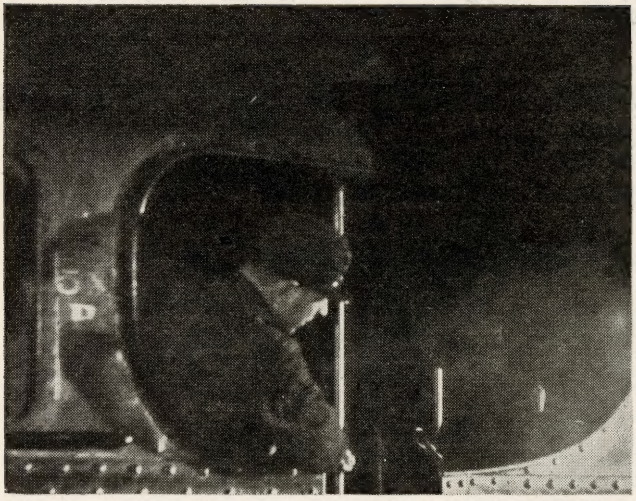
"J'Accuse" by Abel Gance; Feyder's "Crainquebille"; "Mayerling," with Lil Dagover; Capra's "Mr. Deeds Goes to Town"; several Buster Keaton two-reelers; "Monokescue," with Ivan Petrovitch and Mady Christians; an early railroad drama, "Le Train 1346" (probably featuring Helen Holmes); "Diavolo l'Intrepid," featuring the stunt star of the old silent days, Richard Talmadge; "Tom the Tiger," with Tom Mix; "Volga! Volga!" by Victor Tourjanski, with Hans Adalbert von Schlettow and Lillian Hall-Davies; several Shirley Temple films; and Flaherty's "Nanook of the North" (though this is now available on 16mm. from the British Film Institute).

The American amateur can take his pick of:

"The Birth of a Nation"; "The King of Kings"; "Dr. Jekyll and Mr. Hyde"; "Tartuffe"; a considerable number of Westerns, featuring Tom Mix, Al Hoxie, Bravenheart, etc.; "Plastic Age" (Clara Bow); "Stepping Out" (Ford Sterling); "The Square Deal" (William S. Hart); nearly a hundred Snub Pollard single reelers; a selection of Andy Clyde and Billy Bevan two-reel comedies; "Block Signal" (Jean Arthur); "Romola" (William Powell, Colman, Gish); "Phantom of the Opera" (Lon Chaney); "Charley's Aunt" (Sid Chaplin); "Tillie's Punctured Romance"; some Charlie Chase comedies; a number of Will Rogers comedies; D. W. Griffiths' "Abraham Lincoln"; "Feet First" (Harold Lloyd); "Wide Open Faces" (Joe E. Brown); "Lorna Doone" by Thos. H. Ince; and several comedies—some complete, also numerous excerpts—featuring Bobby



*(Continued on page 358)*



# Night Mail

★

FAMOUS LIBRARY FILMS No. 26

★

*At Crewe—shot (a). CM.S. Driver turns away from window, after receipt of the "right away."*

## A CRITICAL COMMENTARY By H. A. V. BULLEID, M.A.

| | | |
|---|---|---|
| **Production** | .. | G.P.O. Film Unit, 1935. |
| **English Release** | .. | May, 1936. |
| **Distributor** | .. | A.B.F.D. |
| **Length** | .. | 2,250ft. =25 mins. |
| **Directed by** | .. | Basil Wright and Harry Watt. |
| **Sound direction** | .. | Cavalcanti, Auden, Britten. |
| **Scenario** | .. | Basil Wright. |
| **Photography** | .. | Jones, Fowle. |
| **Montage** | .. | Harry Watt. |
| **Sound** | .. | Pawley, Sullivan. |
| **Special verse** | .. | W. H. Auden. |
| **Players** | .. | Travelling Post Office and L.M.S. Railway Personnel. |

Available on 900ft. 16mm. SMPE=(25 minutes) from the Central Film Library, Imperial Institute.

*NIGHT MAIL* was one of the very first documentaries to achieve a widespread commercial showing, bookings covering most towns. More, it achieved widespread appreciation, and was undoubtedly a milestone in the road of documentary film—that rather twisting road upon which refugees from the publicity stables jostle with small fry travelogues and sponsored indigestibilities, the occasional really good films towering high above the rabble. Just so does *Night Mail* tower, in spite of all its faults : though it must be said that these are mostly faults of omission, and to the average audience it made memorable by its lyrical treatment a comparatively commonplace subject, and showed where to seek the beauty.

**Subject** :—The Night Postal Special from Euston to Scotland.

**Arrangement of Material** :—Message from Euston to Crewe Control—the train en route, aerial shots—its progress, signal box routine, passing Platelayers, shunting a Local, a farmer gets his paper.—Picking up mail-bags—Crewe junction, connecting trains steam in, one is booked late—Control agree to delaying Postal Special—Postal Special arrives, change of Staff, change engines, late connection in, mail rushed across, right away. Journey proceeds through industrial Britain. Work of sorting the mail goes on—some bags bound up and put out, more bags collected. On through the country (accompanied by W. H. Auden's verse), the climb up Beattock, Scotland waiting beyond, the merry rush down, the waiting Cities, the train steams in : and outside the running Shed stand other engines, a veritable team of Power.

**Theme** :—the importance of the mail, the work of the Postal Special.

The directors presumably decided to strike a balance of importance between the *mail* and the *train* themes : and as will have been seen from the material chosen this has been quite nicely done with the exception of the two opening sequences, which are really lamentable. The first is a telephone message, a Railway routine of no importance to the present theme, dull dialogue and almost negative visuals : the second is a collection of really foul shots—anything less inspiring than the roof of a railway carriage is hard to imagine, and the variations in speed of the

aircraft cause the apparent movement of the train to vary disconcertingly. Meantime a Commentator has told us : " *At 8.30 p.m., weekdays and Sundays, the down Postal Special leaves Euston for Glasgow, Edinburgh, and Aberdeen.*" Either a plain dramatizing of the departure, or a brisk little 40-second sequence of the adventures of a post card posted in Euston Road *just in time* to catch the train, would have been preferable.

The last aerial shot dissolves to L.S. of a signal box in which, however, the down main line leading into the distance draws the eye away from the box, thus weakening the CUT to signal box interior, where the signalman telegraphs " . . . *take the Postal Special* . . ." MIX to telegraph wires MIX to next box, receipt of message, line clear indicator : then . . .

(a) CM.S. The signalman moves away from the indicator.
(b) CM.S. (low angle, from behind signal levers) he pulls one, then . . . (*First Clang*)
(c) C.S. (high angle, levers and name plates behind) . . . he pulls another . . . (*Second Clang*)
(d) CM.S. (as b) . . . he pulls the third
(e) C.S. A signal : it goes down . . . . (*Third Clang*)
(f) C.S. The indicator needle moves over to *train on line.* (Sound of train in distance)
(g) L.S. (from inside box, levers in foreground) The train approaches, passes. (Sound swells up)
(h) FL.S. The train on and away : the solitary signal against the twilight sky drops back to danger. (Sound fades into the distance)

This is a lovely sequence : note in particular a brilliant cut at (d) to (e), the three clangs coming incisively from the excellent sound track (though we wish it had been a silent-background recording) and the anticipated sound of the train, before we actually see it, at the moment of swing-over of the indicator. The last shot is memorable, so lovely is the sky.

The Platelayers sequence is nice but uninspired. We wonder why they should be working into the night without any lights, and we have never heard platelayers telling each other the names of passing trains. They are not given to superfluous dialogue.

" *Four million miles every year ! Five hundred million letters every year !* " intones the commentator, emotionally, as the train proceeds in aerial L.S. Leaving aside the accuracy of the former statement, upon which a simple multiplication sum throws doubts, the sound track has again been allowed to overshadow the visuals : recall the superior presentation of statistics in the opening sequence of *The General Line.*

A really good economy of shots marks the shunting of the Local : the signalman's C.S., one shunting movement, a passenger's query : then the sound of the train, and in C.S. the local's driver and fireman *watch* it pass. A grand, if hardly twilight, aerial L.S. follows the train as the collecting points on the route are explained. Then a farmer leads in a white horse, glances at his watch : the rattle of the train comes, and in C.S. an evening paper lands by the track ; he scans the Cricket scores, shouts news across the fields . . .

A lovely low-angle shot, the sun's rays almost horizontal, shows the train sweeping on. Then Postmen bring mail bags to the side of the line, " *At thirty-four points between London and Glasgow, Postmen wait with local mails, to deliver them to the Postal Special.*" They hang the bags on the special clips : fine panning L.S. shows the train proceeding over a bridge, then low angle of the waiting Postman is contrasted admirably with low angle L.S. as the train passes, scooping up the bag : " . . . *those letters were posted in Bletchley half an hour ago.*"

Fade-in, L.S. a smoky greyness, two tall chimneys, two lights . . . " *Crewe—main junction for the Midlands.*" This is a nice

***The Signalman telegraphs : " Take the Postal Special." (Filmed on location).***

***Night Mail by Wright and Watt—In the sorting vans, work proceeds, (Filmed at Blackheath).***

touch. CUT to dim L.S., awaiting empty platform trucks. Then the connecting trains arrive: one hauled by a 2-6-0 "Crab," one by a Midland Compound. The bustle and activity of handling the mail bags is excellently portrayed, the night-time photography having a grand air of reality. Suddenly a tracking-forward C.S. shows a note on the arrival board: the Holyhead connection is running nine minutes late, the station staff decide they'll have to hold the Postal four minutes. Good establishing L.S. introduces the Control, and one of the Controllers confirms that the Postal may be delayed. Dark, dramatic L.S. shows the Postal speeding on, the low angle again well used with the towering high smoke-box of the Royal Scot loco. C.S., signals drop to safety. T.S., the rails fly back beneath us. Pan M.S. a *taper-boiler class 5XP* loco slowing down. L.S. a *parallel-boiler "Baby Scott" class 5XP* draws the Postal in to the platform. This triple error not only shatters the continuity, but forces doubt on to the film's overall accuracy, which in a documentary should be impeccable.

The thirteen minutes' booked stop at Crewe is well handled: the crews change over, some being hooked out of the refreshment room: mail bags are thudded on to trucks: engines are changed the coupling of the new engine being excellently shown in two angles well cut on action. Then an official shouts up "*Where's that Holyhead stuff?*" C.S. the late notice. Wheel tapper proceeds imperturbably. L.S., a group of men waiting (an excellently timed effect, it exactly conveys the impatience of delay). Then in L.S. the Holyhead arrives. Wrongly, the producers have used for this another shot of the same train with 2-6-0 loco as previously shown. An excellent high angle shot shows the platform trucks, laden, snaking along to the Postal . . . "*about time, too . . .*" The natural sounds are ideal. Then comes the slamming of doors, the right away, the whistle, and . . .

(a) CM.S. Driver turns away from window.
(b) M.S. Wheels and motion start moving: TILT UP to engine moving . . .
(c) M.S. In cab, driver looks out.
(d) M.S. Post Official swings himself . . .
(e) M.S. (taken from train) . . . on to the train.
(f) LM.S. Two Railway Officials talking, train moving behind them.
(g) M.S. (as c) but now steam throws the dark of the cab into relief.
(h) L.S. The engine proceeds, pale steam around it.

This is nicely done, particularly a brilliant cut at (d) to (e). A documentary film should avoid showing process errors, hence the leaving open of the firehole door in (c) when the fireman is not firing should not have been shown. Conversely, the cloak of steam in (h) is dramatically effective and permissible; even though it may upset the Running Shed Foreman.

Dim long shots and travelling shots—too dim to be effective—carry us with clanking sound-track through the section of Industrial Britain. In the sorting vans work proceeds. One bag is emptied, turned inside-out: another full one taken up, packets of mail fly around, protests and back-chat. A difficult address—the supervisor assists, but here the acting quality suddenly embarrasses, the directors have failed to work up easy action. Tea is prepared. Mail for Carnforth is packed up: a new man is on duty and his inauguration facilitates explanation. The bag is secured to the clip.

"*Out now?*" "*No, no. You want two bridges and forty-five beats.*" He looks out: CUT to shot from top of tender, passing under a bridge. He counts "*One.*" CUT to the same, for second bridge. He counts, synchronizing his whispered "*One, two, three. . .*" with (tilt to C.S.) his counting fingers, and with the tapped out rhythm of the wheels. The net is also prepared. The old hand winks quite solemnly: the other waits . . "*Now!*" And the bag is hanging out. The catching of the bag and springing back of the lever are well cut: further shots show more bags being taken up by the train. They reach the sorting van . . . "*. . . about time. Where've you been?*"

The second of two lovely FL.S. pans over the Border Hills discovers the distant speck of steam. The sound track gives the slow, steady beat of a powerful loco working heavily on a steep gradient: not the actual sound, wisely; but a musical interpretation. Then comes the poet's voice . .

*"This is the Night Mail,*
*Crossing the Border,*
*Bringing the Cheque and*
*The Postal Order.*
*Letters for the rich,*
*Letters for the poor,*
*The Shop at the corner, and*
*The girl next door . . .*
*Pulling up Beattock,*
*A steady climb,*
*The gradient's against her, but*
*She's on time."*

The flash of the fireman's shovel, the beat from the engine chimney, the spin of the motion, emphasize the beat. Above, the dawn light breaks in the sky, Long shots, dissolved illustrate the description of Scotland waiting, beyond. The fireman wipes his brow, but the sunlight falls on the west side of his head. Then speed is gathered at the descent, in C.S. the motion whirls, the poet's tempo gallops up. . .

*"Letters of thanks,*
*Letters from Banks,*
*Letters of joys*
*From girls and boys . . ."*

***The Platelayers—and a continuity error: the Postal Special's "Royal Scot" loco has suddenly become a "Midland Compound."***

The ring of the wheels is here again admirably captured. A sheepdog runs down a field. Rabbits scatter. Pistons work furiously. A flash of steam whirls across L.S. of towering chimneys. . . Then serene L.S. of Glasgow, MIX to Edinburgh, MIX to Aberdeen: in FL.S. over the expanse of metals the train pulls in: the shot goes in a vast panorama as the words of the poet conclude, "*. . . and none will hear the Postman's knock without a quickening of the heart: for who can bear to feel himself forgotten?*" The pan ends in L.S. of locos outside the Shed: MIX to M.S., the Royal Scot class *Seaforth Highlander*, with cleaners at work. *Fade out.*

The weakness of the ending is the second of the omissions referred to earlier: there should have been a conclusive final shot, even if no more inspired than the train coming to rest at Aberdeen. Again, the homogeneity of the whole could have been increased by introducing the guard at one period—even at the expense of some of the repetitive sorting-van footage. A renewed glimpse of the team at the end of the run, or at a final cup of tea, would have helped to round off the tale. Pondering on the material employed, one simply cannot help seeing that more could have been done in the way of detail, and improvements could have been effected in general tidying-up: thus to the enquiring mind (to which a documentary will first appeal) the unexplained steam of a banking engine on Beattock will be a puzzle. Moreover, the train's history after Glasgow would be of interest: some footage taken from the Platelayers and the Farmer might well have served to indicate this, leaving in all a film of no greater length, but one more comprehensive, more concise, more adequately carrying its powerful and responsible title, *Night Mail*.

Our last complaint of omissions concerns the montage. Admirable and memorable though we find the words and rhythms of W. H. Auden, we recall that this is film we are watching, the one medium wherein rhythm can be controlled with extreme finesse: and the cutter should at least have used 3-shorts-and-a-long in his montage down the bank, giving the triple rhythm:—

| | | |
|---|---|---|
| Words | .. | "Letters of thanks," |
| Wheels | .. | Ta- ta- ta- TUM, |
| Shots | .. | Short, short, short, long. |

This might well have become a classic example of the use of metric montage. It would have had the advantage of preventing two errors: the first, that this is a carriage-wheels rhythm (adjacent pairs of bogey wheels clicking over the rail-joints) whereas only engine-wheel shots are used: the second, that there is a *pause* between every set of four beats, whereas the poet wrongly cut the pause. Compare (wicked anomaly, that a silent film could create more memorable a sound rhythm!) the railway-carriage scenes in *The Spy* (1928, by Fritz Lang) where a six-wheel bogey followed a four-wheeler, and hammered into Gerda Maurus's brain the serial number of the carriage . . .33133 . . .33133 . . .three three ONE three three . . Had Wright and Watt recalled the carriage wheels, then we would have been happy indeed to see the later labour of the sorters, not to mention their unsteady attempts at tea, against the rollicking roll of the train. The actual idea of using the Auden verse was due to Grierson, Cavalcanti, and Wright.

All scenes were the "real thing" except that Broad St. station was used for some of the Crewe scenes, and the Sorting Van interior was built at Blackheath Studio.

The fact that this film hands to the audience the sights and sounds of the actual job is the best proof of its fundamental merit, its considerable artistry, and its documentary value.

# Moving the Camera

## By BASIL W. HARLEY

DURING the past ten years or so, the professional film makers have made increasing use of camera movement for transitions : transitions from longshot to close-up or vice versa, from low to high angle shots, or for following a character from one set to another. The result is that a greater freedom and fluidity of movement on the screen can be achieved than when transitions have to be effected by the cut or the dissolve.

By comparison, the average amateur film, even the serious and well planned picture, is noticeably lacking in smooth and effortless movements from shot to shot or scene to scene. We cannot hope to emulate the involved tracking shots such as those in " Citizen Kane " or the tremendous distances traversed in the final shots of " The Hunchback of Notre Dame," or the more recent " Rhapsody in Blue." Nevertheless, with a little ingenuity and planning, considerable camera movement can be done without a lot of special equipment.

Two things are vital when considering moving the camera. One is to be sure why you want to move it, and where you want it to go. The other is to ensure that the movement is as smooth and regular as possible. We are concerned here with this second essential.

Let us examine the simplest form first : angular movement in either horizontal or vertical planes, that is, panning and tilting. Even with the friction control on a good modern pan-and-tilt tripod head it is still far from easy to avoid jerky movement on the screen, particularly when photographing comparatively static objects. One good method, when there is no action to be followed in the finder, is to line the camera up on the starting position, determine the angle to be traversed and, standing well away from the camera, slowly move the panning handle across.

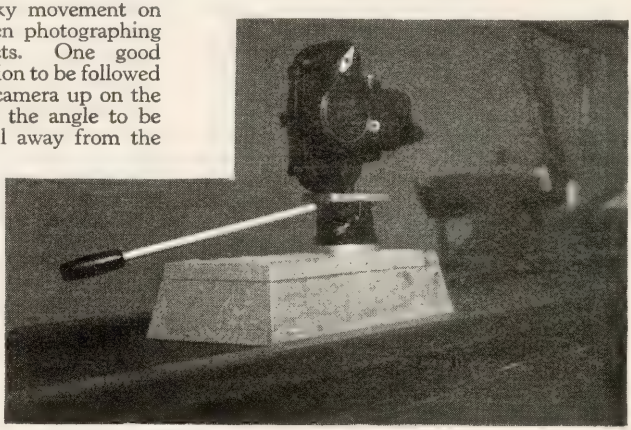
This will overcome one of the chief causes of jerks, the fact that in order to look through the finder one's body must move with the camera.

A tilting shot is particularly susceptible to this trouble, since the operator's knees have to give way smoothly and progressively as the handle comes down—a gymnastic feat well nigh impossible !

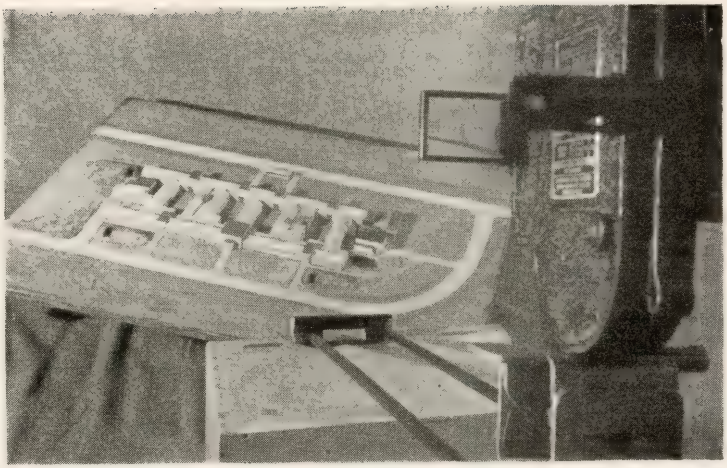
Before we leave consideration of panning movements there is one trick—giving an impression of a parallel tracking shot—worth remembering. The object to be photographed, say a man walking, or a car going along, has its course marked out along the circumference of a large circle struck from the camera position. A long focus lens is used, say a 4in. on a 16mm. camera, to give a picture of the subject the size required.

The camera is panned round to follow the moving subject. On the screen the effect will be as though the camera had been on a trolley alongside. The Americans use this method quite often when following the inevitable sheriff's posse in Western films.

Movement of the camera in the accepted sense of the term, however, means moving it round on a truck of some description. The prime essentials are that it may be moved steadily without sudden starts, stops or variations in speed. In order to achieve this the truck should have rubber tyres and, most important, as long a wheelbase as possible. This is to minimise angular camera vibration, and to this end it is also desirable to keep the tripod as short as possible and to have a fair mass in the truck at a low centre of gravity. Bearing these points in mind let us see what



***Camera and tripod head mounted on a heavy block of wood resting on a conveyor belt.***



*Arrangement for combined camera and subject movement. The model is mounted on a turntable and moved as the camera tracks in on the slide rails.*

we can do in the way of improvisations.

Most amateur cinematographers do the greater part of their work out of doors, and here the most easily easily available "truck" that can be pressed into service is the car. Provided that the camera is firmly fixed to the body, either by fastening the tripod down or by screwing to a temporary bracket, steady pictures can be obtained.

Unless an impression of a journey at speed is wanted, the engine should not be used—a happy arrangement in these days of rationing—but the car should be pushed by hand. This, of course, necessitates two or three people, one on the camera, one to push, and possibly a third to steer if the distance to be covered is far. The heavier the car the steadier will be the resulting pictures.

If a car is not available it is sometimes possible to use any wheeled truck that happens to be handy. I have made a very good tracking shot from an old bath chair on a smooth tarmac path! While on the general subject of exteriors, the use of boats on rivers and lakes should not be overlooked. With a short tripod it is easy to get the smoothest possible camera movement from a flat-bottomed punt. Often the character can be walking along the river bank without it being shown in the film that the camera was on the water, or even that any water is there at all.

Pictures from steamers and launches are rather more difficult, since the engine vibration is usually considerable. It is generally advisable to hold the camera in the hand, and get oneself wedged firmly against some part of the boat. The engine vibration will then be largely damped out before it gets transmitted to the camera.

Any shot involving movement of the camera necessitates rather more rehearsal and preparation than work with a static camera, and it is work indoors that provides the best facilities for this. It should be stressed that even slight tracking movements advancing towards or receding from the subject can have great aesthetic value, and a tracking movement of, say, two feet from a M C U to a C U may be all that is required.

The average amateur is likely to have around the home two things that can be used, the titler and a dinner waggon. Most title boards have a carrier for the camera, and some form of polished guide rails along which it can be moved, giving a range of between two and three feet movement. The whole board can be fixed rigidly, and the camera and its carrier slid evenly along. Such small movements are usually effective with close shots of people, or of small objects when it is desirable to get a closer view without cutting to another camera position.

With care it is also possible to use the dinner waggon for very short distances, but the usual swivel wheels and the generally light construction does not make it an ideal trolley. It is likely to be of more use as a moving table for models, etc., the camera remaining fixed and the object being tracked up to it.

Though we are considering camera movement, we can also include apparent camera movement, since it is occasionally more satisfactory to move the subject than the camera. This applies particularly to models. In a recent film I made, it was necessary to have an aerial view of a model factory. The camera was to swing round in an arc from one end of the model to the other, and at the same time track in to give a close shot of some special buildings.

It was impracticable to make a camera crane to do all this, so a combination of camera and model movement was determined

upon. The model—measuring about 2′ 6″ x 2′—was mounted on an old gramophone turntable and the camera on the title carrier. At the start of the shot the camera was about five feet away at the top of the slide rails.

Then the model was slowly swung round through about 90° and towards the end the camera was slid in to a distance of three feet or so. The lamps illuminating the model were fixed to the same base board, and so moved with it. Considerable time had to be spent on rehearsal to make sure that the view was as required at all positions, and that at no time did glare from the lamps strike the lens. The final effect upon the screen was most satisfactory.

The principle adopted on the title board—a carrier and slide rails—may also be used in a modified form for longer runs. A heavy piece of timber, say 3′ long by 1′ wide by two or three inches thick, may be used as a base on which the tripod head and camera can be mounted. It is possible to push this over smooth table or bench surfaces, preferably up against a guide rail of some sort, and get very satisfactory shots. This is a comparatively simple method, and is of particular value when shooting industrial films, since there are nearly always long runs of benches or steel girders along which the camera can be pushed.

The industrial film provides countless opportunities for effective tracking shots. Once again the valuable short tripod can be used in conjunction with a number of wheeled trucks and trolleys usually found in abundance in any factory. The floors are generally of concrete, and are smooth enough to permit fairly steady travel, though sometimes it is not possible to get really professional steadiness on the screen.

A further source of movement can be found in the numerous power-driven cranes, conveyors, etc. The large block of timber with camera attached can be placed upon a belt conveyor to give a slow movement while photographing the operators working at the benches alongside. This provides an excellent opening shot to a sequence dealing with their work.

Power-driven telphers or cranes traversing, say, the length of a machine shop, or even out of doors, can all provide a moving platform, in this case for both operator and camera. On any such power-driven equipment it may be necessary to take precautions against vibration, and it is generally safer to hold the camera in the hand while leaning against some part of the structure. There is, in any case, seldom room for a tripod in the cab of a factory crane.

It will be found well worth while to spend an hour or two studying the possibilities of moving shots in any film. We have already seen that more time must be devoted to rehearsal, and in this connection focussing becomes a major problem. It is almost essential to have depth of focus tables, since it is advisable and very much easier to keep the distance traversed by the camera within the depth of field for the particular lens, stop, etc., used.

It is often, however, necessary to move the camera beyond these limits. Some few cameras have the focussing scale visible in the viewfinder or, like the Zeiss Movikon, have a coupled rangefinder. This enables the cameraman to adjust the focus himself as the distance between the lens and subject alters. Since, however, the majority of cameras do not have this refinement, it is necessary under these circumstances to have an assistant to change the focus. With regard to the actual lens, it is useful to remember that the shorter the focal length the more apparent will be small advancing or receding movements of the camera.

We have discussed this subject at some length, but it must not be thought that we advocate taking every shot in a film from a travelling camera. This is far from the case, and, in fact, if the choice had to be made between "all movement" and "no movement," the static camera would win.

The instruction manuals' general exhortations to hold the camera steady are well justified, for many a beginner's efforts are reminiscent of practice with a hosepipe, and an idly restless camera is the most irritating thing on earth. Nevertheless, the judicious use of camera movement in a well planned film is something that every serious amateur should be able to accomplish.

## HOME-MADE FILM CEMENT

We are indebted to Mr. J. P. J. Chapman, A.R.P.S., F.R.S.A., of Bournemouth, whose first-rate work in the 16mm. cine field will be familiar to many readers, for an excellent film cement formula. Not the least of its merits is that it will positively stick Kodachrome—and remain stuck.

| | | |
|---|---|---|
| Take : | Acetone | 20cc. |
| | Chloroform | 4cc. |
| | Glacial Acetic Acid | 2cc. |

Dissolve in the above two inches of cleaned film base (16mm.).

Chloroform is, of course, a scheduled poison, and although a chemist will usually supply to a "known person," it is advisable to ask your druggist to make up the solution (you must, of course, tell him the purpose for which it is required) and add the film scrap when you get it home.

Mr. Chapman tells us that he has used this cement with great success for ten years. Variations of the formula will, of course, be well known to most experienced workers, who can be recommended to try this one.

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# MULTIPLANE MODEL SETS

**Part V.**

*In each issue our contributor supplies worth-while ideas: things to make and things to do. Suggestions for gadgets are welcomed.*

## By G. A. GAULD, B.Sc.

WE have already settled the "true scale" area of the stage as lying between "Front Stage" and the first plane containing the large mushroom house. Throughout this area, the puppets may move to and from the camera as well as across its field and objects such as rocks, tree stumps, etc., should be constructed to the correct scale of one "doll's" foot equals one inch if lying in this active part of the stage and given some degree of solidity as well.

This applies to objects in the first plane itself, for it must be realised that the camera is able to "see round the corner," particularly when the objects lie to either side of the field. Items such as the mushroom house must therefore be given solidity if the correct illusion is to be maintained and suitable materials are wood, plaster of paris, papier mache, etc.

The camera is unable to appreciate solidity in relatively distant objects and the remaining planes may therefore be cardboard cutouts constructed in the manner described in the second article in this series. The fact that these planes lie close to the camera in the model stage is of no consequence ; the point that matters is that they represent distant objects and the effect on the screen will be quite satisfactory.

To keep the total depth of the stage down to reasonable limits, when the first plane is 40 inches from the camera, the remaining planes may be set up at intervals of 4 inches bringing the backdrop to 60 inches from the camera. There is no particular point in spacing them further apart, but if they are placed nearer to each other, difficulties may be experienced in lighting them evenly.

Since the use of the graphs was described fully in the preceding article, it is unnecessary to go into details and all the information required, including that obtained by the graphs is summarized here :—

| *Plane* | *F.S.* | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|
| Distance from camera on full scale (Doll's ft.) | — | 40 | 70 | 175 | 350 | 700 | 3500 |
| Ht. of man on sketch, ins. | — | 3.5 | 2.0 | .8 | (.4) | .2 | (.04) |
| Distance of plane from camera, inches | 26 | 40 | 44 | 48 | 52 | 56 | 60 |
| Width of plane, inches | (10) | 16 | 17½ | 19 | 21 | 22½ | 24 |
| Plane Scale, No. of ins. per Doll's foot | 1.0 | 1.0 | .62 | .27 | .15 | .08 | .017 |
| Drum dia. inches (1) | — | 1.91 | 1.18 | .52 | .29 | .15 | — |
| do. do. (2) | — | — | — | — | 1.43 | .76 | .23 |

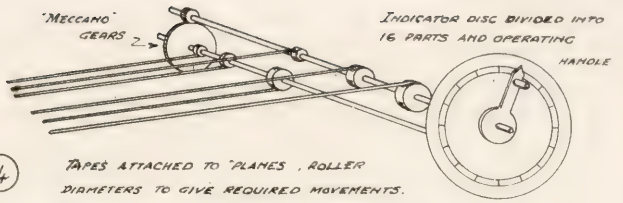
In each issue our contributor supplies worth-while ideas: things to make and things to do. Suggestions for gadgets are welcomed.

The last two items will be explained shortly.

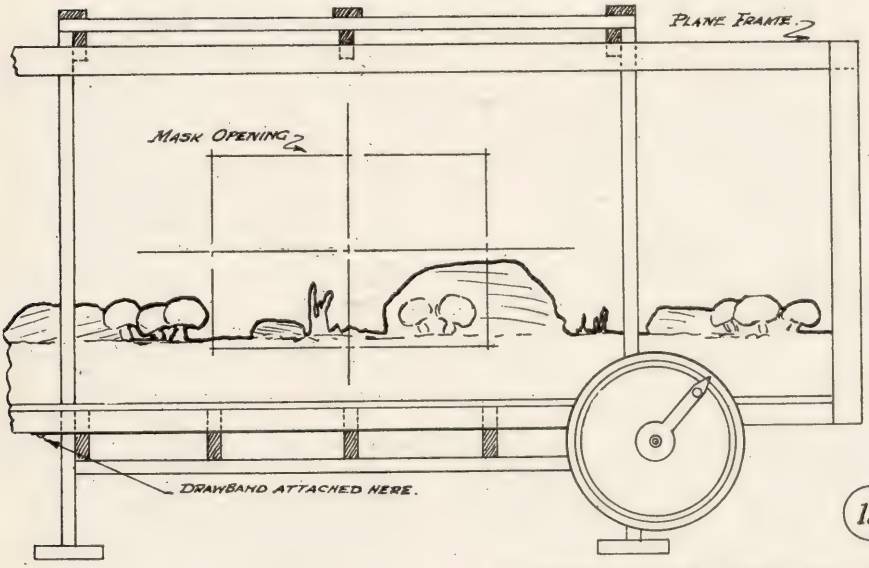
One of the first steps in animation must be the determination of speed, the relation between movement and time translated into terms of frames. To refer to our example, it will be remembered that the little man was in a hurry and we may assume that if our two dolls are to follow him through the wood they must do so at a fairly brisk pace, say four "Doll's" miles per hour. When we come to animate the dolls, one pace (or, strictly two) will form a repetitive cycle and for convenience this cycle should take place in a finite number of frames. Taking the regulation pace of 27 (Doll's) inches and assuming that we are working at "silent" speed, 16 frames per second, one pace takes place in about six frames, and one frame means a movement of .375 feet.

If we use the "camera trolley mounted on railway track" system, and there is no particular point in this instance in using the more complicated "Hinge-point" method, in addition to animating the puppets, we have the problem of moving each plane at its true scale equivalent of .375 "Doll's" feet. This may seem a formidable proposition, but, in practice, it boils down to a very simple operation. The method employed is shown in Fig. 14.

A series of drums are mounted on a shaft, and from each drum a tape or wire is led to the corresponding plane. The diameters of the drums are arranged to give the correct relative movements and where these become very small, as in the case of the distant planes,



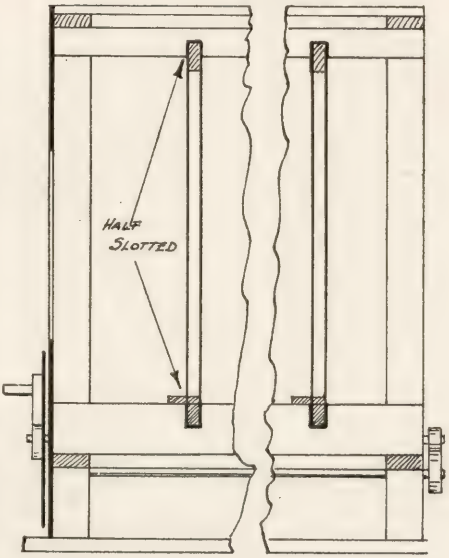

14 TAPES ATTACHED TO PLANES, ROLLER DIAMETERS TO GIVE REQUIRED MOVEMENTS.

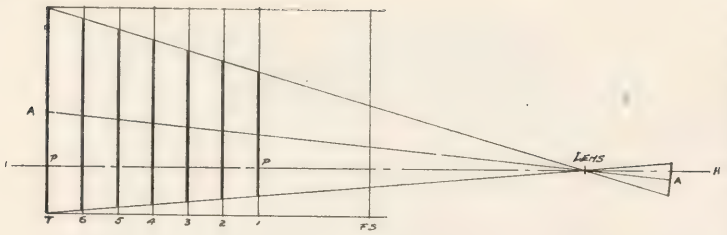



15

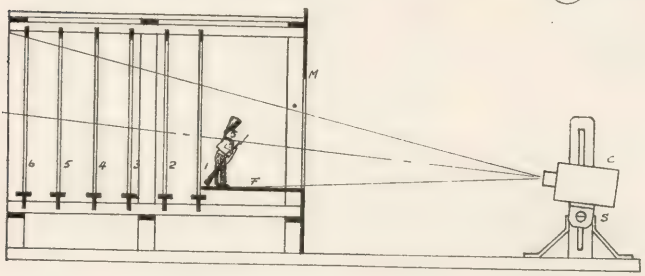
the second shaft driven through a reduction gear is used. The operating handle works over an indicating dial divided into sixteen parts, so that one division corresponds to one frame and one complete revolution is equivalent to one second of running time. Thus all the complicated movements which have been worked out boil down to a single movement of one handle for each frame exposed. And here is another advantage. If time exposures are used with ordinary lighting, the movement should be imparted *during* the exposure and not before it. This causes a blurring of the near planes, an effect which will be observed if the frames of an ordinary movie are examined. This will produce a much smoother movement on the screen and the jerky effect often noticeable in cartoons when rapid movement takes place will be avoided.

It is a simple matter to determine the size of the drums. In our example, in which one frame means a movement of .375 feet, one complete revolution, or 16 frames will be six feet. On No. 1 plane, for example, where






16




17

the scale is one inch to the foot, the required movement of the stage plane will be six inches. The periphery of the first drum must therefore be six inches, and remembering that the periphery is "$\pi$" times the diameter, the diameter will have to be :—

$$6/\pi = 6 \times 7/22 = 1.91 \text{ inches.}$$

The drum diameters for the remaining planes are worked out in the same way until we come to No. 4. Here the scale is .15" to one foot and the six foot movement becomes 0.90 inches on the model set. This gives a drum diameter of 0.29" which is getting rather small. Assuming that a 1:5 reduction gear is used, we can use a drum five times as large on the "slow" shaft, or 1.4 inches diameter. The wire for No. 6 can be fixed directly to the shaft.

Extreme accuracy in the drums is not necessary and they may therefore be cut by hand out of hardwood and trimmed up on the shafts by means of a rough file and sandpaper. An ordinary wood screw driven into the side and through to the shaft can be used as a "grub" screw to fix the drum to the shaft. The point will have to be filed down until the screw goes home flush with the surface of the drum. The shafts should be about 3/16" diameter and are best made of silver steel obtainable from dealers in model makers supplies.

Now, from here onwards, my own work is very much in the experimental stage and I can only make recommendations as to the lines on which model stages may be built. A general idea is given in Fig. 15 in which a framework is built up on a solid base to carry the planes. These take the form of light frames to which the cardboard cutouts may be fixed and I have given an indication of a small platform to each in case additions in the way of semi-solid objects require to be added. The frames are arranged to slide freely in slotted guideways top and bottom and the actuating mechanism can be mounted conveniently to one side. Provision should be made to mount it on both sides according to the direction in which the planes are required to move in relation to the camera, and I would recommend as large a dial and operating handle as possible. This will give greater leverage leading to greater accuracy and better control. The front of the stage should be masked off so that all lighting will be cut off from the camera except where it is required on the set, but the masking must be adjustable.

I previously referred to a slight complication introduced by varying the camera angle from dead horizontal, and in the example discussed, a low camera position has been chosen since we had been following the little man in the preceding shot. The horizon or vanishing point line in perspective is below the centre of the picture and this implies that the camera has an upward tilt—a cine camera does not possess a rising front. We thus have the position shown in Fig. 16 in which H-H is the horizon line and A-A the camera axis.

Now the tilted camera makes no appreciable difference to the plane widths and each plane may be drawn out from the designer's sketch in the normal manner. The rearmost plane is then fitted up on the stage and the camera arranged so that the lens is at horizon level and tilted up to cover the whole of the backdrop scene. If a string is now stretched between the actual centre of the backdrop

# Tribute to a Pioneer

A REMARKABLE lecture, which, in its scope and the astonishing industry which went to its compilation, was a fitting tribute to the great pioneer of cinematographic engineering in honour of whose memory it was given, was delivered by Mr. George H. Sewell, A.R.P.S., early this year. This was the second Arthur Newman Memorial Lecture, founded jointly by the R.P.S. and B.K.S., and dealt with "Some Applications of Photography and Cinematography in Wartime."

An indication of that scope and industry is the fact that, in collecting material from the fighting services, research units and leading ministries, the lecturer wrote over some 200 letters, and although he modestly pointed out that the survey was "by no means complete and comprehensive," it provided the most convincing evidence that photographic processes made an important contribution to the technique of modern warfare which resulted in final victory.

Mr. Sewell referred not only to technical but also to social and humanitarian applications of photography and cinematography, ranging from the use of films and film strips in training and education and public relations in all the fighting services and the war factories and the civilian world, to technical descriptions of methods used in research, development and control of new arms and new methods of warfare.

Particular reference was made to Mr. Newman's own contributions in the form of two different types of camera by means of which hundreds of thousands of service personnel had been examined by mass miniature radiography, a twin oscillograph recording camera employed by the Otological Research Department of the Medical Research Council, and various types of the famous Newman-Sinclair cinematograph camera employed in a wide variety of methods of research, control and training.

Among other outstanding equipments the lecturer described a high speed camera taking 60 pictures at a maximum frequency of 100,000 pictures per second, the Eastman Kodak high speed camera using 16mm. films at speeds up to 4,000 pictures per second and the Weston Electric Fastax cameras using 16mm. film up to 4,000 pictures per second and 8mm. film up to 8,000 pictures per second. These were used for the analysis and development of all types of projectiles and armaments and in connection with the development of components for various forms of transport. Another notable achievement was a type of high-pressure discharge lamp giving an exposure time of 1.5 microseconds and emitting 33 million candle-power.

A description was given of the remarkable work of the Metal Box Company on behalf of the War Wounds Committee of the Medical Research Council in preparing many thousands of photographs in full colour to assist the study and treatment of injuries and diseases arising from war conditions.

Photography played its part in the development of Pluto, the protection of our food stuffs, the protection of those making illuminated sights for war instruments, the preparation of graticules for use in gunsights, theodolites and the tool makers' microscopes, the development of new methods of farming and the use of mechanised farming methods.

One interesting piece of work was the use of stop motion methods to prepare instructional films on large scale farming methods. In one case a Paillard camera making its one exposure every two seconds was used to produce a film which condensed two day's ploughing into 40 minutes' screen time.

The whole procedure of the work carried out in the Naval Control Room on D.Day and afterwards was photographed day and night at regular intervals, 12 pictures being taken every ten minutes for the first three days and then continuing with diminishing frequency for several months.

It is hardly necessary to remind readers of the important part played by aerial reconnaissance—1,200,000 aerial photographs were interpreted in connection with the fly-bomb battle alone. The operations of modern warfare called for many maps, 90,000,000 being prepared before D.Day. Much of this work was done by map-making units with complete photographic and printing equipment carried on mobile units and working in the field from a constant stream of new information obtained by aerial reconnaissance and other methods.

During the war the 16mm. film came into its own, and many millions of feet of 16mm. were printed each month for supply to all the services and the ministries.

## MULTIPLANE MODEL SETS. Part V.

*(Continued)*

and the lens, then each of the other planes can be positioned because their centres will lie on this line. Thus the front stage "plane" will be relatively low on the stage in this instance and the opening should be masked accordingly.

Provision for tilting and height adjustment should therefore be incorporated in the camera mounting and the general arrangement shown in Fig. 17 should require no further explanation. The bracket "S" is held in place by a bolt with a wing nut to the rear which in turn works in the vertical slot giving height adjustment.

When everything is set up, do not forget that the scene will appear to be correct only when viewed from the position occupied by the camera lens; from any other point, it will appear to be out of proportion. Final adjustments to the positions of the planes vertically, and for that matter, horizontally should therefore be carried out with the camera removed and with the eye placed as nearly as possible to the lens position—then wind the handle and you will get the "Multiplane" effect all right!

***Winning the Peace!***

***Although the war is now over the need for waste paper is still as urgent. The time to relax all effort is not yet. Please go on saving all you can.***

**Notice to Readers and Advertisers**

Please note that we have left our war emergency premises and are now back at our London offices, Link House, 24, Store Street, London, W.C.1. Telephone Number: **Museum 9792** (4 lines).

# CINESMITH CONVERSION OF PATHESCOPE 200B PROJECTOR

A CUSTOMER'S projector, equipped with the above mentioned conversion was submitted to us by Cinesmith Products with the agreement of the customer.

The conversion consists of the modification of the existing projector to permit the interchange of sprockets, feed and take-up arm spindles and gate to enable both 9.5mm. and 16mm. film to be projected.

The spindle conversion is a simple one. On to the existing 9.5mm. spindles, which are of small diameter, are slipped well-fitting sleeves with the appropriate square shoulders at the inner ends, to fit the standard 16mm. projection spools. These sleeves are slotted at their outer ends, and the turn-over tag on the spindle which also holds the spool in place fits into the slots and thus imparts rotational drive to the whole assembly.

The sprockets, whether 9.5mm. or 16mm, are held on to the sprocket spindles by knurled concentric nuts on the outer ends of the spindles. The inner ends of the sprockets are bored, each with one eccentric hole that engages with a pin on a plate on the sprocket spindle, in similar manner to the eccentric pin system employed to drive the 9.5mm. projection spools. It is a matter of only a few seconds to make the exchange.

Provision for the two projection sizes is made by means of an additional "gate," and a multiple type of claw. The three mechanisms are so inter-related that according to whether the 16mm. or 9.5mm. arrangement is in operation, only the appropriate claws can be engaged with the film, although the complete set of claws are solid with each other and always in operation. This is accomplished by arranging that the inserted additional gate brings the film to a different plane. The 16mm. claws are longer than the 9.5mm. claws, and without the additional gate 9.5mm. film lies down snugly on to the centre claws, while for 16mm. the additional gate lifts the film forward off this plane to engage only with the 16mm. claws.

The projector is fitted with an asbestos lining to the lamphouse and provision for a high power lamp, but as the instrument was sent without a lamp no practical test could be made of projection. We are able to report, however, that the transit mechanism deals with both sizes of films smoothly and efficiently.

With the exception of one small piece of accidental damage apparent in the instrument submitted, the workmanship and inspection appeared to have been carried out in a first class manner. The materials and finish are good and attractive, and the conversion has no appearance of makeshift.

The price of this conversion inclusive of one 16mm. 400ft. take-up spool and return carriage to client is £6 14 6. Trade discount is allowed if the machine is sent through a dealer.

Cinesmith Products inform us that the adaptor plate as fitted to the machine submitted to us is to be replaced (immediately tooling up arrangements are completed) with a new adaptor of similar design but differing in form of manufacture. While the present fitting has given no trouble in service it is inclined to be weak due to thinness of metal around the light aperture and consequently there is a possibility of the plate becoming bent at this point if carelessly used.

The new improved adaptor plate is to be of one piece of polished steel with 16mm. nails formed to a tubular box section for resistance to bending. Besides being stronger, the new adaptor is also much lighter than the old one. The new plates will be made available to existing users of the conversion at cost plus postage.

The firm do not supply sets of parts for clients' own assembly, but complete kits of parts with full instructions, drawings and gauges for assembly, with tools, are available for overseas cine dealers.

## LENS COATING

The Westminster Photographic Exchange, Ltd., and Dollond & Aitchison, Ltd., announce that, by arrangement with the Pullin Optical Co., Ltd., they are now in a position to coat or "bloom" lenses of all types. It is stressed that the very high reputation of Pullins is guarantee that there is emphatically no danger of the lenses being incorrectly re-assembled or in any way damaged. The process is carried out on internal glass surfaces only.

On the invitation of the Westminster we have arranged for one of our own lenses to be treated, and hope to report on the result in our next issue.

* * *

It is pleasant to see new cine accessories being advertised once more. Before the war a descriptive leaflet was too often only casually glanced at; now one studies it with eagerness even though, like the list recently put out by Actina Ltd., of 19, Woodstock Street, New Bond Street, W.1., it may be only a four-page folder—but four pages well filled.

This leaflet features all the firm's lines, including their latest introduction, the folding tripod of four section. Other items of interest are the "De Luxe" Exact filter holders, the Actina screens, the Duowind folding rewinder and spools and cans.

* * *

What promises to be a most interesting meeting of the Association for Scientific Photography is scheduled for Mar. 28 at the Caxton Hall, Westminster, S.W.1., when C. W. Bunn, B.A., B.Sc., will read a paper entitled "Towards Atomic Photography." Details of membership of the Association, which offers many advantages to both still and cine workers, may be obtained from the Secretary, Tavistock House N., Tavistock Square, London, W.C.1.

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| 9.5 Specto Special Model, with extras and films, cost £35 | £25 0 0 |
| 8mm. Kodak Latest All cast, an entirely new, model | £30 0 0 |
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## PART-EXCHANGE DESIRED ON PROJECTORS & CAMERAS

# TRACKING it DOWN

*Secretary:* **C. LESLIE THOMSON, B.Sc.**

## Secretary's Report

AS T.I.D. enters its fifth year, it also enters a new phase. Up to the present, conversion interests have been given more space than any other single subject: but the time has come to make a change. Right from the start, T.I.D. has insisted that converting a silent projector to show sound films is not everybody's job. We know from sad experience that only a relatively small proportion of all conversion attempts have reached completion, and that of these not all have been genuinely successful. A much larger number have been little more than an instructive, but rather expensive, pastime for their "owners."

On conversion expense, a reader writes:—"... as a Production Engineer, I am rather shaken by the high prices charged for cine parts, which are out of all proportion to the work involved in manufacture." This accusation is unhappily often justified. We ourselves know of cases where items such as sprocket-wheels, lenses, optical systems and electric motors have been offered at prices as high as ten, fifteen or even twenty times the cost to the dealer.

Again, the amateur who avoids undue cash outlay by making nearly everything himself has often been wasteful in other ways. After making a first-class job, he is rather liable to suspect that it would have been better to have built the entire projector from scratch, rather than reinforce, modify and adapt an unsuitable silent machine. Many folk have completed a conversion only to find that no library will hire them films—or at least, not on what they consider "reasonable" terms.

However, despite the failures and heart-breaks, we are confident that there have been enough really useful conversions turned out, and modernisations of antiquated apparatus, to justify the attention we gave this topic. Also, it should be noted that under the heading of "conversion" we have included a great deal of essential and otherwise inaccessible information about the various mechanisms and principles of sound-projector design.

Although primarily intended for the builder, we know that many a non-technical reader has found this material interesting and helpful. It enabled him to understand the working of his projector more clearly, and also gave him confidence in assessing the relative merits of different designs and makes of equipment.

But now the peak of projector-scarcity is past, and we intend to confine our attention to other, more general, aspects of sub-standard sound.

We apologise to the numerous readers who have so very kindly sent us photographs and descriptions of their conversions, which we had hoped to print in these pages. We may yet reproduce a small selection of the more outstanding of these—"for the record." However, no reader need feel that his contribution has been neglected. All information

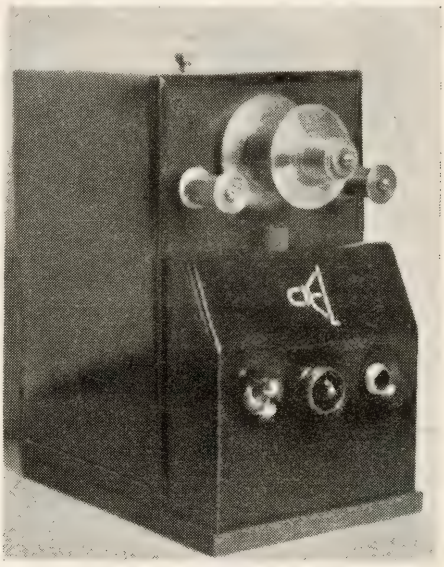

*Fig. 1. The Basic "Track-Reader" Unit. The jack for headphones is on lower right.*

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| Ross 1", f/1.9, 16mm. mount ... | £12 | 4 | 0 |
| Laack, f/3.5, 7.8cm. Dialytar for 16mm. Movie Camera ... ... | £9 | 10 | 0 |
| Meyer Kino Plasmat, 1⅝, f/1.5, 16mm. mount ... ... ... ... ... | £20 | 0 | 0 |
| Kodak 2" Lens for 16mm. Projector | £5 | 5 | 0 |
| Adapters for using Leica lenses on 16mm. camera ... ... ... | £2 | 5 | 0 |

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# NEW PROJECTORS AND CAMERAS

Manufacturers are gradually getting into production again, and although it will be some time before supplies are back to anything like normal peace time level, limited quantities of cine cameras and projectors will be in stock at a very early date. Enquiries are invited for G.B. L.516 sound projectors, Dekko 8mm., 9.5mm. and 16mm. projectors and cameras, and Pathescope equipment. We will forward full particulars of the equipment desired immediately literature is available. Full description of the G.B. L.516 projector in "Substandard Film Review" No. 7. Price 3d., post free.

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sent to us is put into circulation, and although only a small fraction is reported here, all useful suggestions have been and are being, freely used in helping other correspondents with their problems.

Those at present engaged in conversion are, of course, invited to continue to consult us about their difficulties, which we shall be happy to deal with by correspondence. But from now on "conversion" will rarely figure in T.I.D. pages.

During the past few months there has been a welcome increase in our correspondence. Many letters have been from those returning to civilian life, and there have been several requests of the "tell me all that has been going on" variety. Such demands are impossible to meet effectively, particularly since one cannot refer the questioner to back-numbers of *A.C.W.*

However, in our next issue we intend to give a list of the various subjects dealt with by T.I.D. since its inception. This may help the new or "returned" reader to put his enquiry into a form which we can deal with most usefully. It might be permissible to point out that T.I.D. was originated, and has continued, principally because there is no comprehensive and authoritative text-book on substandard sound technique. Therefore, please do not write asking us to recommend "a really good book!"

The business on hand consists of a brief report on a new piece of substandard sound apparatus—the "Track-Reader" or "Transcriber," which is a sound equivalent of the well-known animated viewer—and secondly the concluding instalment of Mr. P. A. Downes's very informative article on the Design of Quality Amplifiers for Sound-film Reproduction.

## 16mm "TRACK-READER"

In the December issue of *A.C.W.*, Mr. George H. Sewell mentioned the advanced amateur's need of a substandard equivalent of the Movieola, and in the same issue a correspondent enquired about similar apparatus for individual viewing of sound films.

A single instrument designed to meet all the various requirements of different kinds of work would have to be fairly complex and expensive. In these respects it would probably be comparable with a sound-projector. However, by working on "unit" lines, the problem may be capable of an alternative and simpler solution.

The accompanying photographs show a possible answer. This amateur-built 16mm.

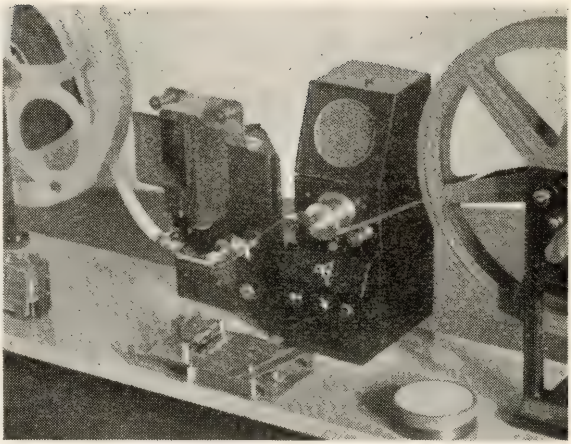

*Fig. 2. Basic Unit plus Loudspeaker Unit, mounted on editing-board, alongside a Kodak Animated Viewer.*

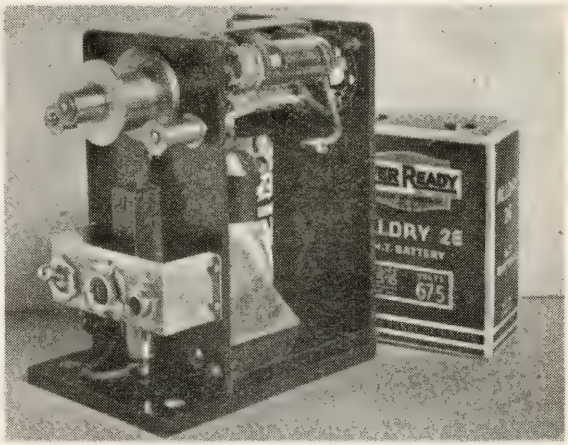


*Fig. 3. Basic Unit with covers removed. Optical System in centre of front panel, above exciter and below rotary scanner. H.T. battery removed. One valve visible above battery space.*

# HATTON CINE

We hope to announce full details of our range of 9.5mm. and 16mm. Super Sound Talkie Projectors in the next issue of the *A.C.W.* In the meantime, may we place you on our mailing list, so that literature may be sent to you when available.

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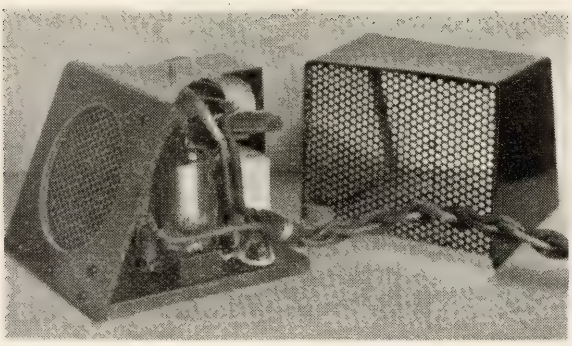

*Fig. 4. Loudspeaker Unit uncovered. Valve can be seen, and two transformers. Unit also contains grid-bias battery.*

"track reader" is essentially simple, very adaptable, and relatively inexpensive. The principal part is the "Basic Sound Unit," shown in Fig. 1. This is complete in itself, and may be used with headphones. It consists of a soundhead with rotary scanner, two-stage amplifier, and the necessary batteries. It measures $5\frac{1}{2}$" x $4\frac{1}{2}$" x 3" overall, and weighs $2\frac{3}{4}$lbs. The total cost of materials and parts was about £7 10s.

The second part shown is the "Loudspeaker Unit," which comprises a power amplifier and the speaker, and it may be plugged into the first unit without alteration. Its dimensions are $3\frac{1}{2}$" x 3" x $2\frac{3}{4}$", and its weight $1\frac{1}{4}$lb. Cost, about £3.

The total power consumption of the combined outfit is exceptionally low, being 0.15 amp L.T. and 3.5 milliamps H.T. These figures are for loudspeaker operation, and include the current for the exciter lamp. Headphone working reduces the H.T. current to only 0.5 milliamp. These very moderate figures ensure an excellent working life for the batteries—a 3-volt "cycle" type and a 67-volt "Minimax."

As shown in Fig. 2, the instrument may be mounted on an orthodox editing-board, "in cascade" with an animated viewer. Alternatively it could be used for a vertical film-path, as mentioned by Mr. Sewell, the speaker being suitably mounted nearby.

At the time of writing, the construction of two other units is nearing completion. These are a simple governor control mechanism which will allow satisfactory musical reproduction with hand-winding, and an alternative A.C. mains unit to provide constant-speed drive. Without these, speech is very clearly rendered, but music is definitely too "wowy" for anything but identification. Either of these speed-controlling units will allow the film to be run at correct pitch, stopped instantly, reversed, or run through at increased speed.

The first test model of the governor control has already given promising performance. The entire mechanism has been designed with particular regard to film-safety.

When the apparatus is completed, full details will be made available to readers in the form of a "T.I.D. Note." In view of the present long interval between publications, anyone particularly interested is invited to make advance application to the Secretary, enclosing the usual 4d. in stamps to cover postal expenses.

## HIGH-GAIN AMPLIFIERS (contd.)

### Power Pack

For high-tension currents up to 100 milliamps, steady load, a full-wave rectifier of the 5Z4 type is suitable. This will handle 350-0 350 volts from the mains transformer and will give approximately 350 volts after smoothing. (Note, if the H.T. current is moderate, the condensers of large capacity and the smoothing choke of low resistance, voltages of 400 or more may be delivered, in which case either a lower output tapping of the transformer or a series resistance should be used.) Indirectly-heated rectifiers should be used to avoid surge voltages when switching on. Where Class AB1 is used the reservoir condenser (immediately following the rectifier) can be omitted to ensure better H.T. regulation. The H.T. voltage will drop to about 250. The smoothing choke must have a high inductance at the maximum current, low resistance, and be conservatively rated. A typical specification would be 20 henries at 120 milliamps, 300 ohms resistance, gapped-type core of at least 1 sq. inch cross-section. To help stabilise the H.T. voltage, and also as a safety measure, all power packs should include a "bleeder" resistance across the final smoothing condenser, passing about 20 per cent, of the total H.T. current. The use of a loudspeaker field for smoothing is not recommended, since this is wasteful of H.T. voltage and not really efficient in removing hum. If the power-pack is separate from the amplifier chassis, it is an advantage to mount a second choke, which may be small and have quite a low inductance, and an 8 mfd condenser on the amplifier to provide further decoupling. It is worth while to

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orient the main choke so that it gives minimum pick-up of hum from the transformer. This can be checked during construction by connecting the transformer to the mains (care that the secondary leads are protected !) and connecting a pair of radio headphones across the choke. The choke is then moved about until minimum noise is heard in the 'phones. (Ideally this test should be performed with the transformer under load—a 230 volt 40 to 60 watt household lamp connected in across one half of the H.T. winding will act as temporary equivalent).

The power-pack chassis is best made of mild steel or planished iron, with top and bottom covers bonded to the chassis. Ample ventilation must be provided for the rectifier. The power pack should be earthed to the main chassis at one point only. (A double connection may form a loop through which induced currents may flow, causing hum pick-up in the amplifier). It is sometimes an advantage to have the main amplifier, power-pack and loudspeaker system in one cabinet, with the preamplifier close to the cell on the projector. The power supply to this should be conveyed by screened and/or decoupled cables. If the projector is fed through a transformer, this should be in a mild-steel or cast-iron case, and remote from the amplifier. All circuits should be separately fused with closely rated fuses.

**Negative Feed Back**

The characteristics of a circuit incorporating negative feed-back are :—(1) Low harmonic distortion. (2) Linear frequency response. (3) Stability. (4) Low noise level. (5) Improved loudspeaker " damping factor " (i.e., cone translates the signal more faithfully). (6) Loss in gain.

There are two types of N.F.B., defined as follows : (a) *Voltage* where the feed-back is proportional to the voltage across the output load ; (b) *Current*, in which it is proportional to the current in the load. In both cases *negative* implies that the fed-back signal opposes and partially cancels the input signal. N.F.B. is particularly advised with beam tetrodes (e.g. 6V6, 6L6, etc.)—see items 1 and 5 above. The push-pull amplifier circuit given in the first part of this discussion (*A.C.W.* Sept. 1945) uses one form of Current feed-back. A type of voltage feed-back which may be used in " single ended " circuits is shown in Fig. 5. In this the values of the resistances R1 R2 are calculated to provide 10 per cent. N.F.B. This reduces the gain of the stage by a factor of approximately 0.4X. Fig. 5 shows a parallel feed-back circuit, applicable to the basic push-pull amplifier described in the Sept. issue. Current N.F.B. is often desirable for phase-splitting valves or in low-gain mixing stages. The removal of the condenser across the cathode bias resistor is usually sufficient. (See note in Sept. issue.) In passing it is worth noting that removing the condenser altogether will not appreciably alter the tone-balance, although some considerable loss in gain is inevitable. If, however, the usual 25mfd condenser is replaced with a 1 or 2 mfd. the N.F.B. will

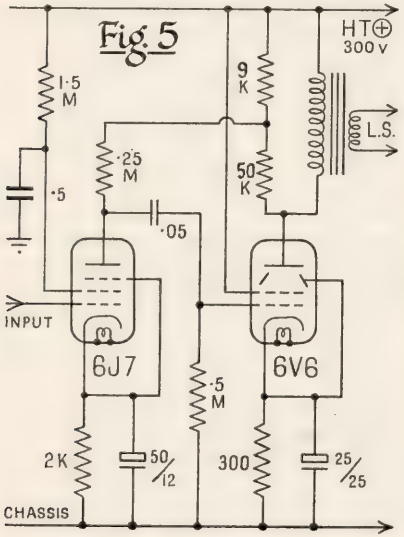


*Fig. 5. Negative Voltage Feed back applied to 'single-ended' output stage.*

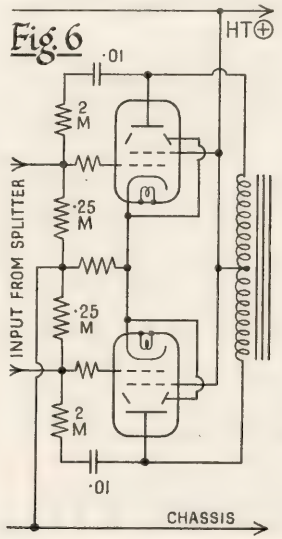


*Fig 6 : Parallel N.V. F-B. in a push-pull output stage.*

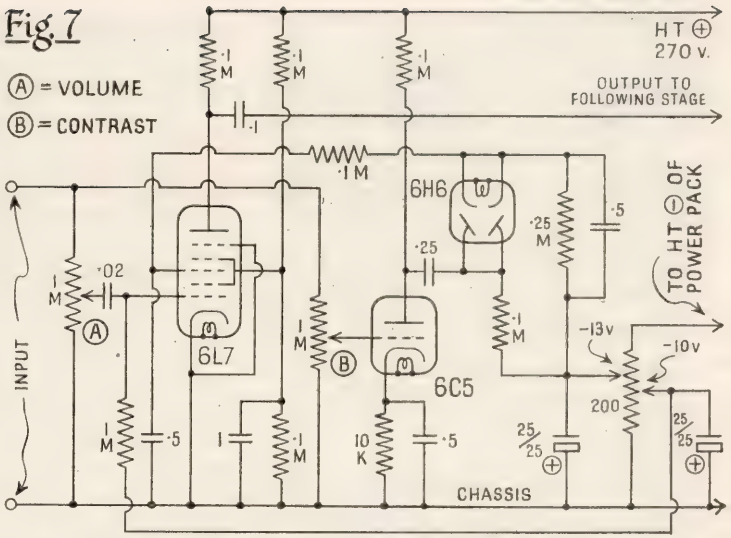


*Fig. 7. A simple Contrast Expansion circuit. (Note: The sole connection of the amplifier to the power-pack H.T. minus is through the 200 ohm resistor. This must be provided with two sliders, adjusted to give the voltages shown, with respect to the amplifier chassis.)*

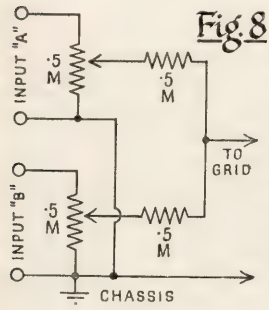


*Fig. 8. Simple Mixing Circuit for two Inputs.*

## Volume Expansion

Volume expansion is an attempt to restore the full contrast range of the original sound, compressed in recording to avoid either over-modulation or excessive background noise. At the present time there is some divergence of opinion as to whether contrast expansion justifies the trouble in substandard sound. For really efficient working the circuit is fairly complex and only a few of the generally available films have the accurately-printed and controlled tracks essential for success. Such defects as over-modulation and over-printed track are thrown into painful prominence by contrast expansion. On the other hand most of the deficiencies of track—and reproducer—are evident mainly during low-volume passages and accordingly a much quieter background and "cleaner" reproduction are possible with C.E. The circuit in Fig. 7 shows a relatively simple arrangement. Volume expansion should be applied at an early stage in the amplifier, as otherwise affect the bass more than the treble, with the result that the sound will have a "toppy" quality. Although this is sometimes used as a form of tone correction the effect is difficult to control and not altogether pleasing.

distortion may arise due to non-linearity in the controlled valves.

## Controls

*Mixing.* Where non-sync. gramo. and microphone are used, some sort of mixing circuit is required. Electronic mixing, as shown in the main amplifier circuit, is desirable, as this provides stability and freedom from "cross-talk." If higher gain is required, the twin triode valve may be replaced by two single pentodes with a common anode lead. A "mechanical" mixing circuit is shown in Fig. 8. This produces a 6 dB loss in volume and is only applicable if the inputs are of the same order of voltage. To avoid noisy action, mixing should preferably not take place before a high-gain stage. Noise may be further minimised by avoiding potentiometers in which the contacts move over the actual carbon track. The "Centralab" type, in which contact is made by a non-rotating plate, is to be preferred. (In any case, dust, dirt and wear are the worst enemies of control silence).

*Tone.* Continuously variable controls are not advisable. They tend to be noisy and in most cases expensive and cumbersome. In addition there is always the anxiety of wondering whether the best tonal balance has been struck! 2 or 3-position switches giving bass and treble cut solve most of the difficulty.

## Miscellaneous Design Points

Especial care should be paid to the pre-amplifier stage. Hum or circuit noise will be amplified by all the succeeding stages.

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Metal envelope or internally-screened valves are advised, such as the "International Octal" series, or the Mullard 9-pin "Footless." All grid, anode and cathode leads should be kept short (1 to 2 in. at most) and screened where necessary in rigid brass or copper tubing bonded to the chassis. The desirability of using D.C. for the exciter has been stressed frequently in T.I.D., but in addition it is often worth running the heater of the pre-amplifier valve on D.C. also. Do not use tagboards or mount resistors and condensers in a close group, as this may cause hum and instability. All wiring should be direct and rigid. The heavier components should be tied to the chassis, and if metal-cased should be efficiently bonded to it. Slack wiring and loose components may cause microphonic noises and crackle. Input jacks, volume and tone controls, plugs and switches should all be carefully screened and control shafts earthed. To minimise magnetic induction hum, the chassis should be of one piece of heavy brass or copper sheet, with a bonded bottom cover and soldered inter-stage screens. The complete amplifier should be remote from heavy-current A.C. wiring, chokes, transformers, energised loudspeaker fields or motors.

## SILENCE IS STILL GOLDEN

(*Continued from page* 335)

Vernon, Louisa Fazenda and Charlie Murray.

Most of these are available on both 8mm. and 16mm., and, of course, there are many more—dozens of Chaplins, scores of good documentaries and educationals, as well as films available in this country. But in this country the Kodak Library has been dispersed and the last news we had of Pathescope was that they were still working to capacity on other commitments.

The movement badly needs the resumption of supply of silent releases. 9.5mm. owed its popularity not only to its comparative cheapness but in great part to the library facilities that were available. Pathescope built up a reputation with them, and although opinions may differ as to the advantages and disadvantages of full and heavily cut versions for home showing, no one will deny that that reputation was well deserved. The amateur hopes that every effort will be made to put out the films he wants to see and that he will not be left to become a mere also-ran to the sound enthusiast.

8mm., 9.5mm. and 16mm. silent library films are wanted. The silent field has received no outside stimulus as the sound field has, but, though dormant, it has big potentialities. The silent film may have been banished for ever from the cinema but it has a firm place in the home, a place that the sound-track will not easily dislodge.

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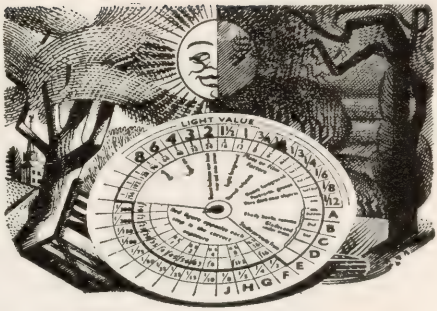


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The principle on which the Calculator was based, however, was so sound that to keep it always up-to-date, only progressive extensions of the scales to provide for increasing emulsion speeds and wider lens apertures have been necessary. The most recent improvement has been the inclusion of pointers to indicate exposure apertures in cinematography — both silent and sound. The 'Wellcome' Photographic Exposure Calculator is the chief feature of

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# News from the Societies

The Officers of the Federation of Cinematograph Societies, whose main task during the war was to keep the organisation in existence, feel that the time has now arrived when steps may be taken to restore it to its previous active and prominent position in the cinematograph world. It is therefore proposed to re-establish Headquarters in London, to undertake some reconstruction, and to begin more active operations at an early date.

Mr. G. Wain, of the Hyde C.S., who took over the duties of Hon. Secretary and Film Librarian during the war years, feels that he is unable to continue in office, and at the next annual meeting it will be necessary to appoint a new secretary and librarian. Nominations for one or both of these offices are requested.

The Annual General Meeting will probably be held in London towards the end of April, 1946, at the Royal Photographic Society's premises, 16, Prince's Gate, London, S.W.7, and, as it is desirable that there should be as full representation as possible, it is hoped that all societies will endeavour to arrange for at least one representative to be present.

* * *

The latest issue of the "Wanstead and Woodford Movienews" reveals a very encouraging state of affairs. It reprints a list of the twenty-four events held during the past year, and details seven fixtures for the current quarter. Included in the first-mentioned were two garden parties and the annual dinner and dance ("the first dress affair for many since the war") at which successful monochrome and colour films were shot. The balance sheet shows that there are 38 full members and 39 associates.

An annual competition is announced, judging to commence on April 12th. Four cups are to be awarded. The entry should be numerically strong, for in an earlier issue of the bulletin the Chairman, Mr. K. C. Blain, comments on the number of films made by members during the past summer. It would appear that the club has been able to obtain good supplies of film stock. Particulars of membership may be obtained from the Publicity Secretary, Mr. C. J. Middleton, 28, The Glade, Woodford Wells, Essex.

* * *

We are glad to learn that Romford and District Cine Society is resuming its activities, suspended during the war years, and that a meeting is to be held on March 15th. All former members and all cine enthusiasts, working in any substandard gauge, who are interested, are invited to communicate with Mr. L. A. Aves, 5, Allandale Road, Romford, Essex. ('Phone: Romford 3274.)

* * *

The Isle of Wight Amateur Cine Society reports that membership is steadily increasing. Recent activities have included visits to the projection rooms of three cinemas, screening of 16mm. colour films, a demonstration by Kodak, Ltd., showings of I.A.C. and M.O.I. films (the former in all three gauges) and a talk on television by a local expert. Members have also given shows to various clubs and children's parties. Details may be obtained from the Joint Hon. Sec., Mr. R. E. Hannah, 1, Queen's Cottages, Old Road, East Cowes, I.W.

* * *

The County Cine & Dramatic Society which has been able to hold only two meetings in the past two years owing to its members being in the Forces, now hopes to hold a meeting in London in the near future. All members and those readers who have applied for membership since the last announcement in our pages will be notified of the date by post.

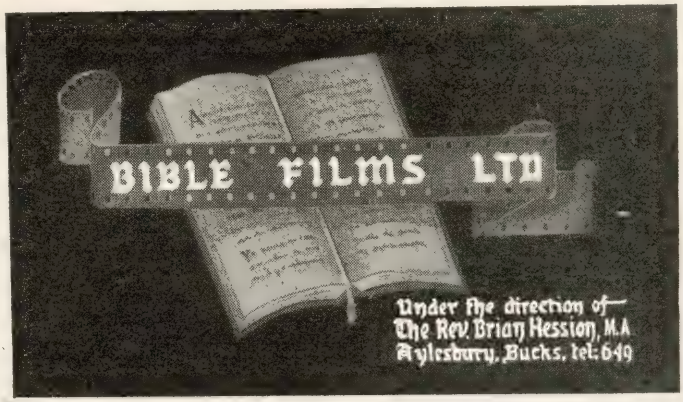
The society is in need of a secretary for its Dramatic Section and would be glad to hear from anyone interested in the drama who would be prepared to organise this side of its activities. Further information may be obtained from the General Secretary, Mr. M. Lester, BM/VJSJ, London, W.C.1.

* * *

The Hyde and Salford Cine Societies which, as reported in a recent issue of *Amateur Cine World*, held joint meetings during the war and have been investigating the possibility of retaining and extending the resultant advantages by amalgamation of the two clubs, have now decided to keep their own individualities and to widen their separate activities.

---

We are asked by The Westminster Photographic Exchange, Ltd., London (established 1903) to draw attention to the fact that they have no connection whatever with any other photographic house or trading concern operating under any name incorporating the word "Westminster," in order to obviate any possible misunderstanding which may arise relative to the alleged black market activities in photographic materials now under investigation at Liverpool.

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### Removing Stains from Bead Screens

Bead screens generally have a form of cellulose vehicle to carry the beads and if this vehicle becomes stained integrally the fault is virtually irremediable.

If, however, the fault is only on the surface it may respond to gentle brushing, and to very careful washing, using good quality soap flakes in softened water, applying only a small quantity and using a very soft brush. This should be followed by thorough rinsing, again using only small quantities of water, applied a number of times with the soft brush. Take care not to get the screen waterlogged. Considerable care is necessary to ensure that the beads are not removed from the screen surface.

Failing this, the whole surface of the screen can be carefully painted with matt white. This will destroy the reflective power of the beads, but give an excellent matt white surface of greater dispersive power, excellent for the projection of colour pictures. It will of course reduce the brightness of the image as seen by the audiences in front of the screen, but will actually improve the reflection towards the audience at the sides.

### Modification of Hand-Turned Projector

It is a little difficult to suggest to you how you could fit a motor drive to your projector, as not only do you not know the name of the instrument, but you give us no details whatever of the design and characteristics of the instrument, the speed of rotation of the crank spindle and so on. These characteristics vary considerably on different makes of instrument.

Generally the crank spindle is geared to run much more slowly than the spindles of the actual film transit mechanism and is therefore not the best point at which to attach a motor drive, unless you are prepared to fit a gear train at some point between motor and crank spindle. The necessary speed reduction can be obtained with a slow running motor by using a grooved pulley of about $\frac{5}{8}$" diameter on the motor spindle and about 2" diameter on the driven spindle. A series wound, fractional horse power motor, designed to run at mains voltage and with a small sliding resistance for speed control, would be suitable.

It is possible that your photographic dealers, or one of the cine dealers who advertises in the columns of *A.C.W.* will have a secondhand Pathescope or similar motor in stock, which will suit your purpose.

But when making enquiries, give as complete details as possible of your instrument.

As from the other remarks in your letter we gather that you are just beginning amateur cinematography, may we suggest that you continue with the use of your hand crank for some time, until you have become familiar with your instrument, its characteristics and limitations before you undertake its reconstruction.

We note that you use an ordinary sheet. This is most inefficient as so much light passes right through and is not reflected back to the audience.

There are three available types of correct screen (a) The opaque white, which gives the finest quality of image provided that plenty of light is available, and (b) beaded and silver, which are both more highly reflective and thus give a much higher intensity of picture within a narrow angle, but fall off rapidly as the observer moves to left or right. The bead screen has also a more delicate and easily damaged surface.

### Lens Data

**Q.** *I have recently purchased a new Movikon 8mm. fitted with an f/2. 10mm. fixed focus lens. As I have never used a lens of this type, I would be pleased if you would tell me:— (1) What is the minimum range at which I could expect objects to be in sharp focus at the various settings between f/2 and f/11 ? (2) I have a portrait attachment (½ metre) which I have been using with an f/3.5 fixed focus lens of 12½mm. focal length. Is this attachment suitable for use with the f/2 lens ? (Used only for titling.)*

*As I shall probably be returning to Australia soon, I would like to take this opportunity to thank "A.C.W." for much help, and to add that I shall remember my stay over here vividly, with the help of a couple of thousand feet of colour film. Keep up the good work with the magazine—I look forward to the time when it once again becomes a monthly publication.—F/O. J.E.D., R.A.A.F., London, W.C.2.*

**A.** (1) If a lens is focussed at its hyperfocal distance all objects will be sharp from half that distance up to infinity within the limits of the circle of confusion accepted for the particular class of work, and for which the hyperfocal distance has been calculated. The hyperfocal distance not only varies in accordance with the focal length of the lens, but also with the aperture employed with the lens of any given focus.

For pictorial work using a negative of normal size the disc of confusion is taken as 1,000th of the focal length of the lens; for Leica and minicamera work it is customary to use 1/1,500th, and for sub-standard cine work 1/2,000th is sometimes used. The smaller disc, however, involves extra stopping down to secure a given depth, and its use is therefore within the discretion of the individual worker.

To calculate the hyperfocal distance (using in the present instance a factor of


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1,000) employ the formula :—

$$H = \frac{1{,}000f/s.}{}$$

where H is the hyperfocal distance
f is the focal length of the lens
s is the aperture or stop number

For an f/2 lens of 10mm. focus it would be :

$$H = \frac{1{,}000 \times 10\text{mm.}}{2} = 5{,}000\text{mm.}$$

which is roughly just over 16'6".

Although your lens is fixed focussed it will be of value to you to know how to calculate the depth of focus when the lens is focussed at other distance than the hyperfocal distance—at which distance you can assume that your fixed focus lens is set.

For depth calculations at other distances use :

$$D_1 = \frac{HD}{H-D} \qquad D_2 = \frac{HD}{H-D}$$

where H is hyperfocal distance
D is distance focussed upon
$D_1$ is far distance to which depth extends
$D_2$ is near distance ditto.

(2) The maximum aperture of a lens does not affect the availability of a supplementary lens, provided that its own diameter internally is large enough not to cut into the maximum diameter of the lens with which it is used.

The theory of the supplementary lens is that, placed at its own focal length from the subject, it emits parallel rays which can be accepted by the main lens of the camera focussed at or near infinity and recorded on the film. Your 12½mm. lens can therefore be used with your f/2 lens.

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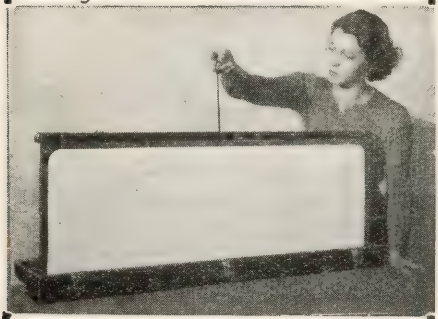

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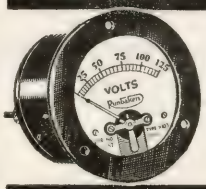


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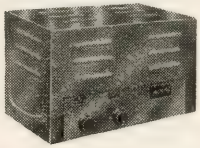

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Latest model Kodak Magazine f/1.9 camera, tripod, 12, cassettes, unused films, Blendux Meter, filters etc., PAILLARD BOLEX G916 projector (spare lamp unused), fitted to table controlling lights for beaded screen, 4' x 3' in box with electric motor for curtains and coloured lights. Rewinder, Cinecraft Titler, splendid outfit, £250, no offers. J. C. White, " Park Lea," Mirfield, Yorks.

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Wanted, good condition, Bolex G916, transformer model, also 30mm. or 40mm. lens for same, also Contax 3 camera with f/2 Sonnar. Box No. 785.

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